IT Unit 3

Topic 1

# Ch 1 Organisations & Data Management

***Characteristics of data types, p 22***

***Elaborate under each of the following data types:***

1. ***Text, (string)***This type of field holds a mix of characters (letters, numbers, special characters), also referred to as alphanumeric, to a limit of 255. Names and addresses are considered text data, as are post codes and telephone numbers as they can contain spaces not intended to be used the same way as a numeric value.
2. ***Numeric – integer, floating point***Numeric fields will only allow numbers to be entered. They are used when the value is to be used in calculation of some kind, for example, the quantity of an item purchased might need to be multiplied by its price to calculate a total.   
   Numeric fields can also be categorised into different variations. ‘Integer’ refers to whole numbers including negative numbers. Where decimal numbers are used, eg, financial transactions or percentages, then the ‘floating point’ data type is used.
3. ***Date***Strictly speaking; a date format is another variation of a numeric data type. The value is normally based on the number of days since the ‘zero’ day built into the operating system or DBMS. Eg, day ‘1’ might be displayed as ‘01 January 1900’, while ‘42673’ would be displayed as ‘30 October 2016’. Calculations can be performed on dates, which can be handy when comparing the difference between them. Dates can be formatted to show a combination of years, months, days, hours, minutes, and seconds, depending on the needs of the user. In terms of time of day, they can also display 12- and 24-hour clocks.
4. ***Character***This text field will only accept a single alphanumeric character. It is used where there are multiple options available for a value, but they can be represented with a single letter to make data entry easier and to save storage space. Eg, the sizes of a wooden box that comes in ‘small’, ‘medium’, and ‘large’ sizes might be entered as ‘S’, ‘M’, or ‘L’, respectively. These options might be selected from a radio button group on a form.
5. ***Boolean***In cases where the data type to be entered falls into the categories of Yes/No, True/False, or even On/Off, the Boolean data type is used. It is often represented as a tick box on forums.

***Databases and database terminology, p 23***

1. ***What is a database?***Databases are used to handle a range of data, from personal details to school results and financial transactions. When searching on the internet, the search is queried into a database which then displays a list of results.
2. ***Explain the relationship between fields, records and tables.*Field:** A field is part of a record and contains a single piece of data for the subject of the item in the database  
   **Table:** a database table is composed of records and fields that hold data  
   **Record:** A record is composed of fields and contains all the data about one particular item in a database.
3. ***Explain the purpose of the following objects in a database: forms, queries, reports & macros.*Queries:** Queries allow you to select a set of specific data based on a series of criteria. The query criteria are the result of the questions we might have of the data, eg, ‘how many of our customers in Fairfield are between the ages of 20 and 60?’ or ‘Can I have a list of names and numbers for all our customers in Fairfield or Northcote?’  
   **Report:** A report represents data in an attractive format and is especially suitable for printing  
   **Form:** A database form shows all or selected fields for one record in an attractive and easy to read format.  
   **Macro:** A macro is a tool that allows you to automate tasks and add functionality to your reports, forms, and controls.
4. ***What is the purpose of SQL?***Structure Query Language, or SQL is a language used in programming and designing for managing data held in a RDBMS.
5. ***Distinguish between a flat file and a relational database? What are the advantages of using a relational data base?*Flat file:** Flat file databases only use one table as a source of data (more restricting)  
   **Relational:** Relational databases use two or more tables as a source of data.

***Relational databases, p 25***

1. ***What does RDBMS refer to?***RDBMS refers to Relational Database Management System.
2. ***Explain with eg.s the following different types of relationships between tables in a relational database.***
   1. ***One-to-one relationship***A one-to-one relationship is used when a record in one table is connected to only one table in a second table, eg, an airliner’s passenger details table will contain records for many passengers, while a seat allocation may hold records relate to the seats on a particular flight. The one-to-one relationship exists between a passenger and their seat location.
   2. ***One-to-many relationship***A one-to-many relationship indicates that one record in the first table can be connected to more than one record in a second table, eg, several workers in an office may share a single telephone extension. Each extension record s related to several employee records.
   3. ***Many-to-many-relationship***A many-to-many relationship is used when each record in the first table can be connected to a number of records in the second table, vice/versa, eg, a student detail table and a subject detail table may have a many-to-many relationship. Each student studies many subjects, and each subject is studied by many students.
3. ***What is meant by a foreign key?***A foreign key is a common linking field in the second table that refers to a primary key in the first table.

***Creating an RDMS structure, p 26***

1. ***Why is it important to consider how to structure the data in a database? What needs to be considered?***It is important to plan the structure of the database carefully in order to maximise the efficiency of a relational database.
2. ***What is the purpose of an entity relationship diagram? (go to p 28 to answer the following).***The purpose of an entity relationship diagram (used by database designers) is to establish the interrelationships between different data elements.
3. ***What are entities, use an eg. from p 28, and how are they represented?***An entity is a single person, place, or thing about which data can be stored. For example, these may include data elements such as ID numbers, names, dates, addresses, and prices. They are represented in fields that are assigned to a table.
4. ***What are the attributes and how are they represented?***The attributes are like fields on a table.
5. ***How are relationships represented?***Relationships are represented by lines connecting to nodes.
6. ***What is the difference between the Chen and Bachman models of representing ERD’s?***

The difference between the Chen and Bachman models of representing ERD’s are that the Chen model looks like a mind-map/brainstorming, while Bachman’s model looks Neater, more compact, and flows easier.